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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/772,572	02/05/2004	Toshihiro Sawamoto	9319S-000664	2262

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HARNESSE, DICKEY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303

EXAMINER
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DIAZ, JOSE R

ART UNIT	PAPER NUMBER
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2815

DATE MAILED: 08/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/772,572

Applicant(s)

SAWAMOTO, TOSHIHIRO

Examiner

José R. Díaz

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 31 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 1, 9, 10, 15 and 16 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7, 8 and 11-14 is/are allowed.
- 6) ☒ Claim(s) 2-6 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/5/04; 7/29/04; 3/4/05; 3/7/05; 5/31/05; 4/14/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of claims 1-14 in the reply filed on May 31, 2005 is acknowledged. The traversal is on the ground(s) that the species are drawn to subject matter which are so related to each other that an undue burden would not be placed upon the examiner by maintaining all species in a single application. This is not found persuasive because the claims recite such a multiplicity of species that an unduly extensive and burdensome search is required. Since the claims are directed to independent inventions, restriction is proper pursuant to 35 USC 121, and it is not necessary to show a separate status in the art or separate classification [MPEP 808.01 (a)].
2. The requirement is still deemed proper and is therefore made FINAL.
3. In addition, claims 1, 9 and 10 are withdrawn from further consideration since the subject matter recited in the claims does not read over the elected species. For example, claim 1 requires a first region with one diagonal line as a border, which is not required in the elected species; and claims 9 and 10 require a rectangle-shaped chip instead of the rectangle-shaped chip carrier substrate required in the elected species.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 2-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Jones et al. (US Pat. No. 6,731,009 B1).

**Figure 5A: First Interpretation**

Regarding claim 2, Jones et al. teaches a semiconductor device, comprising:

a rectangle-shaped carrier substrate (508-4) [see fig. 5A];<sup>1</sup>

a semiconductor chip (508-0) mounted on the carrier substrate [see figure 5A];

a region without a protruding electrode that is provided along at least two sides which intersect at a first vertex of the carrier substrate (consider the “inner sides” of the carrier substrate 508-4 adjacent to vertex A) [see fig. 5A, below]; and

a protruding electrode group (512) which is provided along at least two sides (sides opposite to the “inner sides”) which intersect at a second vertex (Vertex B) of the carrier substrate (508-4) opposite the first vertex (Vertex A) [see fig. 5A, below].

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<sup>1</sup> The Merriam-Webster's Collegiate Dictionary 10<sup>th</sup> ed. defines the term “rectangle” as a parallelogram all of whose angles are right angles. Thus, the term “rectangle” is not limited to a specific length configuration but also encompasses other configurations such as the one shown having a square shape.

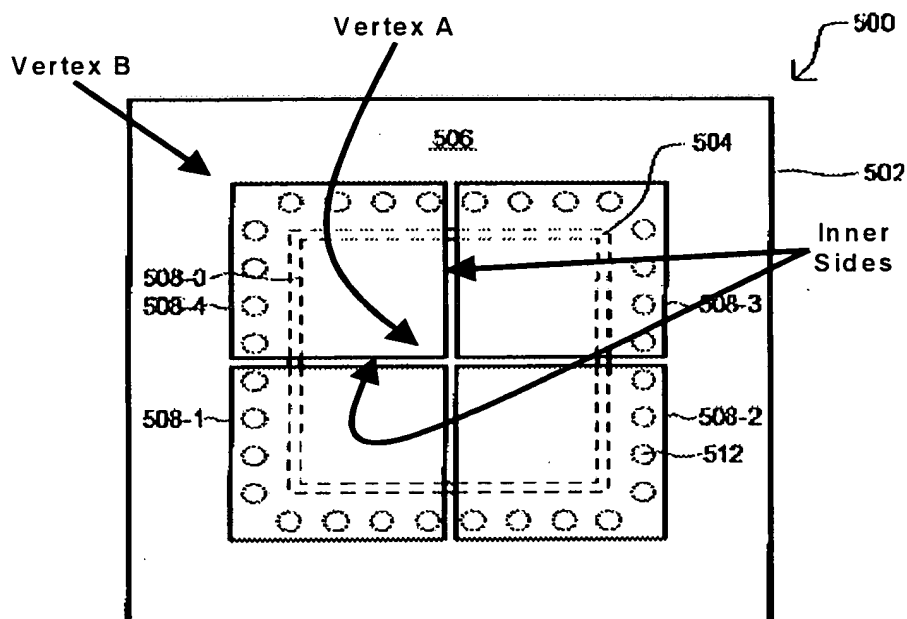


FIG. 5A (1<sup>st</sup> Interpretation)

Regarding claim 5, Jones et al. teaches a semiconductor device, comprising:  
a carrier substrate (508-4) [see fig. 5A]; and  
a protruding electrode (512) arranged on the carrier substrate, excluded from a region where a semiconductor chip (508-0) is mounted overlapped by an end of the carrier substrate (inner sides) [see fig. 5A, above].

Regarding claim 6, Jones et al. teaches a semiconductor device, comprising:  
a carrier substrate (508-4) [see fig. 5A, above];

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a semiconductor chip (508-0) mounted on the carrier substrate [see fig. 5A, above];

a plurality of land electrodes formed on the carrier substrate [It is noted that connections 512 are similar to connections 312 (see col. 6, lines 42-44), which include a solder-bump flip-chip interconnection (col. 6, lines 4-5). Please note that a solder-bump flip-chip interconnection inherently includes pads (e.g. lands) which connects the bumps to the inner wiring of the device]; and

a protruding electrode (512) arranged on a pad of the plurality of land electrodes [see fig. 5A, above].

**Figure 5A: Second Interpretation**

Regarding claim 3, Jones et al. teaches a semiconductor device, comprising:

a rectangle-shaped carrier substrate [consider the rectangle shaped carrier formed by the combination of 508-1 and 508-4. See fig. 5A, below];

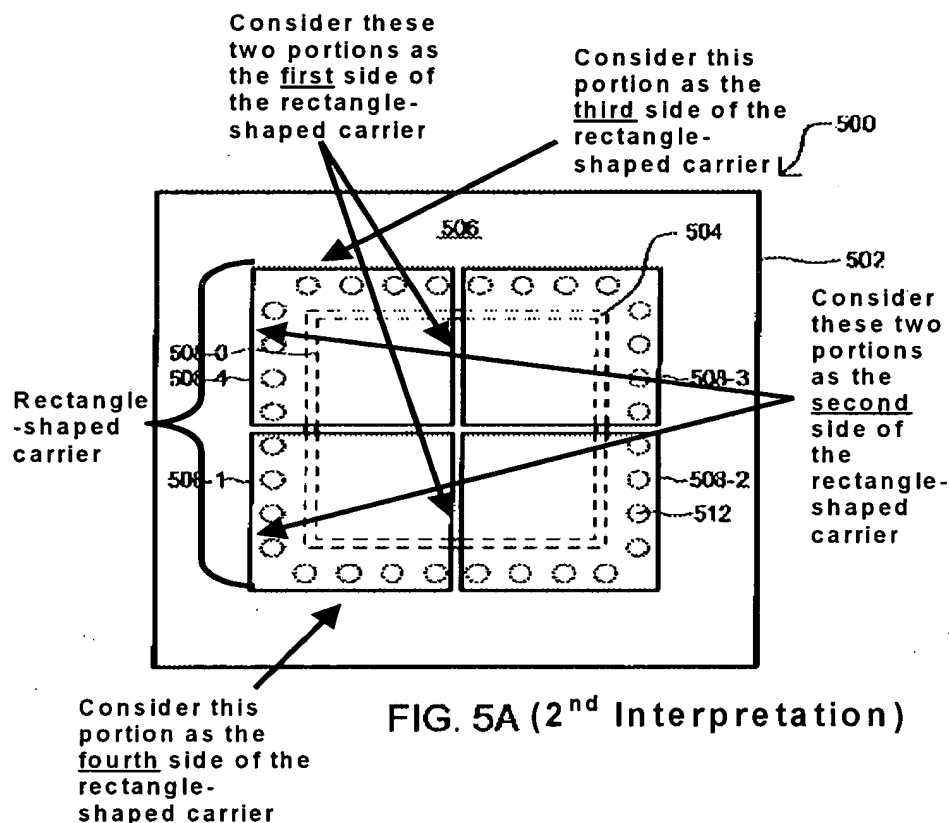
a semiconductor chip (508-0) mounted on the carrier substrate [see fig. 5A, below];

a region without a protruding electrode which is provided along at least a first side of the carrier substrate [consider the first side as shown in figure 5A, attached below]; and

a protruding electrode group (512) which is provided along a second side of the carrier substrate opposite the first side [consider the second side as shown in figure 5A,

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attached below], and along at least a third side which intersects the second side (consider the third side as shown in figure 5A, attached below).



Regarding claim 4, Jones et al. further teaches that the protruding electrode group is arranged in a U-shape (consider protruding electrodes 512 arranged along second, third and fourth sides of the rectangle-shaped carrier as shown in fig. 5A, attached above).

### ***Allowable Subject Matter***

6. Claims 7-8 and 11-14 are allowed.

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7. The following is a statement of reasons for the indication of allowable subject matter: the prior art fails to teach, disclose, or suggest, either alone or in combination, a device comprising a first electronic component mounted on a first carrier substrate; and a rectangle-shaped second carrier substrate bonded to the first carrier substrate so as to arrange the first electronic component under a region of the rectangle-shaped second carrier substrate that does not have protruding electrodes as instantly claimed, and in combination with the additional limitations.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Chiang et al. (US Pat. No. 6,034,425 and 6,023,097) discloses a multiple chip module (MCM) having a region that does not have protruding electrodes (see abstract); Joshi (US Pat. No. 6,489,678 B1 and 6,627,991 B1) discloses a multi-chip flip package (see abstract); Nathan (US Pat. No. 6,903,458 B1) discloses a device comprising a carrier for an integrated chip (see figs. 4A, 5A, 6A, and 7A); and Kimura (US Pat. No. 6,288,445 B1) discloses a device having protruding electrodes (see figs. 3, 4A, 11A and 12A).

### ***Correspondence***


Any inquiry concerning this communication or earlier communications from the examiner should be directed to José R. Díaz whose telephone number is (571) 272-1727. The examiner can normally be reached on Monday through Thursday.

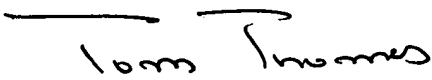


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (571) 272-1664. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
José R. Díaz  
Examiner  
Art Unit 2815

  
TOM THOMAS  
SUPERVISORY PATENT EXAMINER